

**EOSDIS IV&V**  
**Monthly Status Report**  
**For the Period 2/1/96 to 2/29/96**  
(Deliverable 0203.8)

**March 15, 1996**

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## **1. PROGRAMMATIC INFORMATION**

### **1.1 IV&V Project Organization Chart**

Exhibit 1-1 illustrates the current organizational structure of the EOSDIS IV&V team. The approximate number of personnel assigned to each technical task is also indicated.

### **1.2 Overview of Work Being Performed**

#### **a) Key Recent Accomplishments**

- **Programmatic**

- Participated in Monthly Findings Meeting with ESDIS Management on 2/23/96. Focused on significant and on-going issues. Also, introduced the Project Issue Tracking System (PITS) as the means by which IV&V will monitor issues from inception to closure.
- Continued developing and enhancing the PITS. Arranged for a loaner PC to be set up at Goddard so that ESDIS personnel could have on-line access to PITS data.
- Increased IV&V effort on metrics data collection so that progress in system development can be more quantitatively measured.
- Continued addressing the staffing and training needs for Tasks 10 and 11 to ensure high quality performance. Considering alternatives for remote testing at the DAACs.

- **Technical**

- Under Task 4B, conducted ISE demonstration at NASA Software IV&V Facility. Also, continued developing the Project Issue Tracking System (PITS).
- Under Task 5B, delivered TAM on SCDO Release A Requirements Traceability/Testability Analysis. Also, completed BONEs model validation and reported results to Hughes.

**Exhibit 1-1: Org Chart (Landscape)**

- Under Task 6B, submitted TAM documenting review comments on SDPS Release A Database Design and Schema Specification. Also, began developing IV&V Release A test witness plan and identifying test cases to witness.
- Under Task 7, conducted First, Second, and Third ICE Information Exchanges, providing preliminary findings on EOSDIS costs. Also, delivered Community Cost Model (CCM) Basic System Prototype.
- Under Task 9B, reviewed five ICDs and provided Impact Analysis Reports for 10 CCRs. Also, summarized IV&V recommendations regarding interface-type risks on the ESDIS Risk List.
- Under Task 10C, initiated and completed IR-1 Component Testing. Also, conducted extensive test team and ESDIS test status telecons, and provided metrics evaluations relative to Component Test of IR-1.
- Under Task 11A, delivered IR-1 Baseline I&T Procedures and initial version of Version 1 Test Plan. Also, conducted SCF interface testing at EDC DAAC, and continued test team training and dry runs.
- Under Task 13B, planned and completed Controlled Load Testing. Also, delivered TAM on Web IMS interface results, and continued collecting data for the Extended Duration V0 testing.

Additional status information on each of the technical tasks can be found in Appendix A.

#### **b) New/Proposed Task Assignments**

- We recommend a task to provide IV&V support for the instrumentation on the Cassini spacecraft. This work, which involves design analysis and requirements validation, is intended to provide NASA with the needed support until a broader NASA IV&V contract is made available.
- Since IV&V will be the primary user of the EOSDIS Test System (ETS), we believe that it would be in the Government's best interest if NASA directed us to operate and maintain the system after it is fully developed.

### **1.3 Overview of Schedule Status**

Exhibit 1-2 presents the latest, high level milestone chart (i.e., dated March 8, 1996) for all technical tasks assigned on the EOSDIS IV&V contract. In addition, Exhibit 1-3 lists in chronological order the deliverables/milestones associated with the contract for both the current month and the next month, as well as the status of each deliverable/milestone.

### **1.4 Performance Assurance Activities**

- **Performance Assurance Activities**

- IV&V System Administrators have been receiving self-paced training in UNIX at the Goddard Learning Center. This training, which will occur over several months, is intended to enhance their ability to support the Sun-based tools used on the program.
- In an effort to remain current with program trends, various IV&V team members have received tool training at Hughes in OSF-DCE, HP OpenView, and ClearCase.
- IV&V members are planning to attend the Object Oriented Analysis and Design Training which will be offered at Hughes during the week of 3/25/96. This 5-day class will help participants gain a better understanding of the Release B detailed design documentation, so that they will be better prepared for the upcoming CDR.
- Training on SPR's Checkpoint Cost Estimation Tool is tentatively scheduled for April. This training will enable EOSDIS project personnel to continually estimate system development costs over time as requirements change.

### **1.5 Major Short Term Activities Planned**

- **Program-wide Activities**

- Attend EOSDIS Ground System (EGS) Status Review (ESR) scheduled for March 12 and 13.
- Begin Task 14, Cassini Spacecraft Integration and Test Analysis.
- Activate Mentor/Protégé agreement with GEO Control Systems (GSC) to support the System Validation Laboratory (SVL) in Fairmont, WV.

**Exhibit 1-2: Milestone Chart (Landscape)**



Expected Date Due	Dependency	Milestone/Deliverable	Task #	Status*	Comments
2/2/96		First ICE Information Exchange Meeting	7	C	Conducted on time.
2/16/96		ISE Release 1 Demonstration (ISER1)	4B	C	Conducted on time. Date of demo moved to 3/1/96, for Government convenience.
2/16/96		Second ICE Information Exchange Meeting	7	C	Conducted on time.
2/20/96		Basic CCM System Prototype	7	C	Completed on time.
2/29/96		ECS Release A Rqmts Analysis TAM	5B	C	Submitted on time.
2/29/96		Task 6B Monthly Metric Report	6B	C	Submitted on time.
2/29/96		Third ICE Information Exchange Meeting	7	C	Conducted on time. Meeting was divided into 2 sessions, for Government convenience. Session 1 conducted 2/29/96; Session 2 conducted 3/4/96.
No Later Than 2/29/96		EOSDIS Test Version I&T Procedures (Baseline)	11A	C	Submitted ahead of schedule on 2/22/96.
3/1/96		EGS Version 1 I&T Plan (Preliminary)	11A	C	Submitted on time.
3/15/96	Rel B CDR - 1 Month	Release B IRVVP (Preliminary)	6B	IP	
3/15/96		EGS Version 1 I&T Plan (Review)	11A	IP	
3/26/96		ICE Oral Briefing to Key EOS Stakeholders	7	IP	
3/29/96		Release B CDR ECS Model Assessment TAMs (Total of 3)	5B	O	
3/29/96		V0 IMS Client System Performance (Phase III) TAM	13	O	
3/29/96		Task 6B Monthly Metric Report	6B	O	

\* C = Completed, IP = In Process, O = Open, D = Delayed, CX = Canceled

Note: *Italics* indicates tasks that are not yet activated.

### EXHIBIT 1-3: Status of Milestones/Deliverables

- Monitor issues contained within the PITS system and work to achieve closure on the issues as soon as possible.
- Prepare for next Findings Meeting with ESDIS management.

- **Task-specific Activities**

- For Task 4B, continue PITS development and maintenance. Also, continue enhancement and maintenance of the ARDB and TMDB client/server tools.
- For Task 5B, complete testability/trace analysis on Release B requirements, and complete End-to-End Modeling Verification/Validation TAM for Release B.
- For Task 6B, begin witnessing selected Release A tests at Hughes “Test Demos.” Also, attend SCDO Release B design walkthroughs, and submit preliminary Release B Independent Release Verification and Validation Plan (IRVVP).
- For Task 7, prepare for and deliver Final Oral Briefing for ICE. Also, continue developing the CCM by implementing and refining file output structures and underlying subsystems.
- For Task 9B, continue IRD, ICD, and CCR reviews. Also, monitor progress on interface issues and update PITS TIMs to reflect current statuses.
- For Task 10C, complete IR-1 Component All-Sites Test at EDF, GSFC, LaRC, and EDC. Also, develop and deliver Component Acceptance Test (CAT) Flash Test Report.
- For Task 11A, continue planning detailed Version 1 overall I&T and specialized test schedules. Also, continue field work for executing formal Test Version I&T test activities.
- For Task 13B, complete TAMs on Controlled Load Testing, Extended Duration Testing, Ported Client Testing, and Integrated Analysis.

## **1.6 Key Long Range Plans/Schedules**

The IV&V team will support the activities and milestones identified in Exhibit 1-2. Emphasis will be placed on those activities that are on the critical path to support the on-time launch of the spacecraft. Such activities include supporting System Integration, performing Interface and Integration Testing, and conducting System Certification.

The team will emphasize its System Integration and Test (SI&T) role and narrow its IV&V focus to those activities that support successful SI&T. Other IV&V functions will be secondary and will be prioritized based on available funding.

## **2. FINANCIAL/CONTRACTUAL INFORMATION**

**This Section  
Has Been Removed  
Due to Proprietary Content.**

## **APPENDIX A**

### **TECHNICAL TASK STATUS INFORMATION**

## **Task # 4B: IV&V Infrastructure and Tool Development**

### **a) Task Accomplishments**

- Conducted ISE demonstration on 3/1/96 at the NASA Software IV&V Facility.
- Continued developing the Project Issue Tracking System (PITS). Enhancements include the capability to generate metrics reports and project snapshots.
- Modified the Test Management Database (TMDB) as follows:
  - Updated database with Component Acceptance Test (CAT) and System Integration and Test (SI&T) test results from the latest tests conducted at the EROS Data Center in Sioux Falls, SD.
  - Modified metrics capabilities to scrutinize requirement metrics in an attempt to isolate requirements that are not fully mapped from the database to the test step.
  - Began to update the database to the 1/26/96 RTM release.
- Modified the Automated Requirements Database (ARDB) in the following areas:
  - Added capability to display functional status and criticality on requirement analysis screen.
  - Began to maintain and update the analysis status for each requirement.
  - Deployed Release 2.4 at both EOSDIS IV&V locations.
- Prepared and deployed the latest release of the ARDB at GSFC.
- Continued maintenance for the EOSDIS IV&V Homepage and EGS I&T Homepage.
- Performed general system administration activities such as backups, COTS maintenance, and hardware maintenance as required.

### **b) Issues/Concerns**

- By previous agreement, IV&V expected CSC to post RID closure information to the IVV-RID mailbox as RIDs were closed. No RID closure information has been received to date regarding the August, October, or November reviews. As a result, the Issue/Discrepancy Handling System (IDHS) has not been updated to allow analysts to check the status of submitted RIDs.

### **c) Subcontractor Performance**

- EWA performance during this reporting period was very good. They supported system administration activities for the Fairmont facility, as well as the development and maintenance of the EOSDIS IV&V Homepage and the EGS I&T Homepage. EWA also supported the development of the PITS.

#### **d) Planned Activities**

- Continue PITS development and maintenance. Identify process for dumping data from the PITS repository to Excel and Minitab so that trend analysis can be performed.
- Assist in maintaining currency of TMDB data.
- Continue support (refinement, development, and maintenance) for the ARDB and TMDB client/server tools.
- Continue support for the IDHS application. Update the IDHS database based upon RID closure information from past CDR and IDR activities as CSC posts closure information.
- Continue development and maintenance for the EOSDIS IV&V Homepage and EGS I&T Homepage.
- Perform system administration duties for both LANs, hardware and COTS software as required.
- Support program meetings and briefings as required.

### **Task # 5B: Requirements Analysis and Traceability**

#### **a) Task Accomplishments**

- Delivered TAM on SCDO Release A Requirements Traceability/Testability Analysis as scheduled.
- Completed BONEs model validation and reported results to Hughes under Chris Daly's direction.
- Reported IR-1 and Release A requirements status in the February Findings Meeting.
- Revised and reported IR-1 requirements traceability analyses using the January 26 RTM revision.
- Supported CCR review and provided comments on ECS requirements to CCB.
- Converted TAM metrics reported for Release A from text to graphics format. (See Attachment 5-1.)
- Initiated Release B baseline review. Plan to do file utility comparison of all three March 1 RTM exports to ensure that the tapes and on-line versions received are all the same.

- Logged all requirements issues since Release A CDR into Project Issue Tracking System (PITS).

**b) Issues/Concerns**

- None.

**c) Subcontractor Performance**

- Subcontractor performance has been very good.

**d) Planned Activities**

- Complete testability/trace analysis on Release B requirements.
- Complete End-to-End Modeling Verification/Validation TAM for Release B.
- Meet with ESDIS Requirements Manager and IV&V Program Manager to identify ESDIS concerns regarding IV&V requirements analysis activity.
- Support program meetings and briefings as required.

**Task # 6B: ECS Development Analysis**

**a) Task Accomplishments**

- Met with Hughes Release A test team and ESDIS to support IV&V Release A test witness planning. Began developing IV&V test witness plan and identifying test cases to witness.
- Performed EOSDIS document and CCR reviews. Submitted TAM on 2/12/96 documenting review comments on SDPS Release A Database Design and Schema Specification. Documented issues in Project Issue Tracking System (PITS).











- Reassessed FOS design repository issue identified by IV&V during the FOS Release A/B CDR time frame. Documented issue in PITS.
- Generated SCDO Release A metrics on the number of Level 4 requirements allocated to each subsystem and the number of Level 4 requirements that have no traces to the design components specified. Documented results in first Task 6 monthly metrics report submitted to ESDIS on 2/29/96.
- Reassessed issues identified during SCDO Release A CDR analyses. Issues that are still current are being documented in PITS.
- Developed briefing materials for IV&V Findings meeting, and presented findings on 2/23/96.

**b) Issues/Concerns**

- A delay in Deliverable 0611 (Release A Software Development Evaluation TAM) is likely due to the extended delay in obtaining ECS code from Hughes. The schedule impact will be assessed once we are informed of the date(s) that ECS Release A code will be made available to us.

**c) Subcontractor Performance**

- Subcontractor performance has been excellent.

**d) Planned Activities**

- Receive portions of requested Release A code and begin Release A software development analysis.
- Continue test witness planning. Identify metrics to include in the Task 6 monthly metrics report. Begin witnessing selected Release A tests at “Test Demos” scheduled by Hughes.
- Continue EOSDIS document and CCR reviews.
- Attend SCDO Release B design walkthroughs.
- Generate Level 4 requirements metrics based on new release of RTM. Submit March monthly metrics report.
- Submit preliminary Release B Independent Release Verification and Validation Plan (IRVVP).
- Support program meetings and briefings as required.

## **Task # 7: Programmatic and Process Analysis**

### **a) Task Accomplishments**

- Conducted First, Second, and Third ICE Information Exchanges (two sessions) on February 2, 16, and 29, and March 4 respectively. Provided preliminary assessment of costs for ECS development, EOSDIS hardware purchase, and GSFC DAAC M&O.
- Continued data gathering activities associated with the ICE effort. This included reviewing the ECS WBS to provide a better mapping between the development effort and the SPR Checkpoint Model; reviewing the EOSDIS hardware Bill of Materials (BOMs); and conducting a number of interviews with GSFC DAAC personnel to better understand the function and operation of the GSFC DAAC.
- Delivered Community Cost Model (CCM) Basic System Prototype on 2/20/96.

### **b) Issues/Concerns**

- Given the compressed time frame for the ICE effort, we must have all source data in hand by the first week of March, or we run the risk of not having complete and accurate results for the Final Briefing, currently scheduled for 3/26/96. We have specifically identified the missing data and contacted all relevant parties, indicating the urgency of our need.

### **c) Subcontractor Performance**

- SPR (ECS Assessment) and Gartner (Hardware Assessment) have performed very well during this period, providing timely delivery of needed information to the extent possible. Their formal presentations have been polished and well thought out.

Real Decisions' (DAAC M&O) performance has been good to date. They showed a marked improvement in responsiveness this month and provided good content in their second formal presentation to NASA. They still need to provide better support of interim milestones. They also need to be more willing to take a stand on issues based on their expert knowledge.

### **d) Planned Activities**

- Prepare for and deliver Final Oral Briefing for ICE, scheduled for 3/26/96.

- Determine hardware purchase costs for EBNet by conducting a top-down analysis which considers the network's throughput requirements to develop a high level architecture and supporting hardware suite.
- Finalize the Integrated Cost Roll-up Matrix which will be used to compare NASA's estimated costs for EOSDIS with the Independent Assessment Team's "should costs."
- Continue developing the CCM by implementing and refining file output structures and underlying subsystems. Next delivery is scheduled for 4/2/96.
- Support other program meetings and briefings as required.

## **Task # 9B: Key Interface Analysis**

### **a) Task Accomplishments**

- Reviewed five ICDs including EDOS to EGS, EDOS to EBNet, EDOS-ASTER GDS, ECS-GSFC DAAC, and ECS-LaRC DAAC.
- Reviewed TRMM Interface Control Specification, volumes 3 and 4.
- Began analysis of IRD between ECS and the SAGE-III Project, as well as analysis of ICD between EDOS and NOAA.
- Summarized IV&V recommendations regarding interface-type risks on the ESDIS Risk List for Candice Carlisle.
- Generated and provided TBD/TBR/TBS/TBD metrics to J. Roeder (CSC/ICWG) on two interface documents (ICD between ECS and V0; and IRD between ECS and SAGE-III).
- Provided Impact Analysis Reports for 10 CCRs.

- Prepared Technical Issue Memoranda (TIMs) documenting outstanding interface document issues:
  - Unassigned ESN Requirements
  - Lack of Traceability for ECS-NSI Interface Requirements
  - Handling DANs with File Group Errors
  - Product Request (ASTER) Functionality Incomplete
  - Missing DAN Header Field Values ( ASTER ICD)
  - Inconsistent Data Names between ECS-SAS ICD and PDB
  - Data I/F Inconsistency (EBNet-SSIM ICD)
  - Inconsistent Data Flow Description (EBNet-EOC ICD)
  - Missing Data Flows in EDOS-ASTER ICD
  - Possible Service Loss for the ECS-SAA Interface
  - Missing Release B NOAA NMC Data Sets
- Followed up on action item from Findings Meeting and discussed TIM 1037 (Missing Release B NOAA NMC Data Sets) with Peter Lyons, Hughes Interface Manager. Reached agreement that the data flows cited in the TIM are missing in the document.

**b) Issues/Concerns**

- None.

**c) Subcontractor Performance**

- CTA is the task lead for this effort. Their performance has been very good.

**d) Planned Activities**

- Review the following documents: EDOS-NOAA ICD; IRD between ECS and SAGE-III; TRMM Specific Parameters document; and EDOS Reshape documents.
- Develop CCR Impact Analysis Reports on the following: CCR 505-41-42-001-A, Baseline the ECS to TSDIS Interface Control Document; and CCR 505-01-36-002, Baseline the EDOS to EBNet IRD.
- Monitor progress on interface issues and update PITS TIMs to reflect the following: Resolution of SCF and NOAA CCR issues; and requirements for a directory search service between ECS and the NOAA NESDIS SAA.
- Support program meetings and briefings as required.

**Task # 10C: EOSDIS Independent Component Acceptance Test**

**a) Task Accomplishments**

- Initiated and completed IR-1 Component Testing in February. Tests were accomplished at LaRC, GSFC, EDC, and Hughes EDF sites. Testing of MSFC hardware at GSFC DAAC was discontinued based on SMO direction.
- Continued to attend ETS development informal system design reviews.
- Managed test effort based on detailed schedule plan for staffing and conducting component test activity; continued team/M&O training and dry runs during component test activity.
- Conducted extensive test team and ESDIS test status telecons; provided metrics evaluations relative to Component Test of IR-1.
- Began supporting SMO ERB to discuss and resolve DRs resulting from Component Test activity.
- Began planning format of Flash Test Summary Report.
- Initiated development of detailed test process and top level schedule for Release A Component Acceptance Test (CAT).

**b) Issues/Concerns**

- None.

**c) Subcontractor Performance**

- Subcontractor performance has been good; however, continued emphasis should be placed on staff planning and time scheduling.

**d) Planned Activities**

- Complete IR-1 Component All Sites Test at EDF, GSFC, LaRC, and EDC.
- Develop and deliver IR-1 CAT Flash Test Report on 3/6/96. Also, prepare and deliver summary briefing on 3/7/96.
- Develop IR-1 Component Test Report for delivery in April.
- Begin planning for Release A CAT.
- Support program briefings as required.



## **Task # 11A: EOS Ground System Integration and Test**

### **a) Task Accomplishments**

- Initiated Test Version I&T test activity. Specifically, conducted SCF interface testing at EDC and continued to perform limited team training and dry runs during component test startup activities.
- Completed development of IR-1 Baseline I&T Procedures; delivered on schedule and placed on Homepage on 2/22/96.
- Continued discussions with Code 505 personnel on disposition status of Action Items from DAAC One-on-One Meetings.
- Continued supporting Landsat 7, AM-1 and TRMM technical interchange and MRTT/SITWG meetings.
- Completed a top level Test Version Level 4 I&T tracking schedule. Added dates for major possible joint tests and integration steps for SSI&T.
- Supported ongoing analysis of joint test efforts for TRMM and Landsat 7. In addition, initiated AM-1 efforts to define the ECT tests during this period.
- Delivered initial version of Version 1 Test Plan on schedule on 3/1/96. Continuing requirements analysis between EGS subsystems and ECS CAT Release A test efforts.

### **b) Issues/Concerns**

- None.

**c) Subcontractor Performance**

- Subcontractor performance has been good; however, continued emphasis should be placed on staff planning and time scheduling.

**d) Planned Activities**

- Continue planning and building detailed Version 1 overall I&T and specialized test schedules.
- Continue meetings with AM-1, L7 and TRMM/TSDIS personnel to define joint test objectives and plans for Version 1 tests.
- Continue field work for executing formal Test Version I&T test activities.
- Formulate use of TMDB and TDM tool for Task 11 support. Complete development of TMDB and transition resources to other ongoing I&T activities.
- Continue developing plan for Version 1 I&T test program, due 3/15/96 for community review.
- Continue staff technical specialty planning and detailed ECS system training.
- Begin planning for test witness of EDOS and EBNet tests later this year as early deliveries emerge.
- Support program briefings as required.

**Task # 13B: IV&V Special Studies**

**a) Task Accomplishments**

- Planned, coordinated, and completed Controlled Load Testing; began work on the TAM.
- Analyzed controlled load test data.
- Delivered TAM on Web IMS interface results, and met with Greg Hunolt to present TAM results.
- Continued efforts on the installation of the V0 IMS ported client.
- Continued collecting data for the Extended Duration V0 testing.

**b) Issues/Concerns**

- Results on CDR modeling will not be fully available in time for the end-to-end performance evaluation TAM, which is scheduled to be delivered two weeks prior to CDR.
- Making the V0 Ported Client operational has proven to be problematic. This issue will be given the highest priority. To date, we have not been able to identify anyone who has successfully installed and used the IMS Ported Client for Sun/Solaris.
- The schedule for Task 13 is very tight. The test effort must be completed and four TAMs must be generated within the next four weeks.

**c) Subcontractor Performance**

- CTA is the lead for this task. Their progress has been very good.

**d) Planned Activities**

- Complete the Ported Client test effort.
- Complete testing/data collection for Extended Duration V0 analysis.
- Complete TAMs on Controlled Load Testing, Extended Duration Testing, Ported Client Testing, and Integrated Analysis.
- Participate in Motif training seminar.
- Support program meetings/briefings as required.

**Appendices B and C  
have been removed  
due to proprietary content.**